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The ORGAN Experiment

Thursday 21 June 2018 12:50 (20 minutes)

We discuss the current status of the ORGAN experiment, a high mass axion haloscope. The goal of ORGAN is to search the promising high axion mass regime, covering the range of masses proposed by the SMASH model.

This talk will include a review of progress and results to date, then cover developments in cavity design and R&D, and the next science run of the primary haloscope experiment.

Cavity R&D builds on our work on tunable super-mode dielectric resonators [1], with applications to the high-mass regime. These resonators can be designed to have scan rates improved by 1 to 2 orders of magnitude over traditionally tuned haloscope resonators.

The plans for the next experiment, which will operate in a new dedicated dilution refrigerator with a base temperature of 7 mK and a 14 T superconducting solenoid, will be discussed.

We will also give an overview of some complementary experiments that are under development at UWA to operate alongside ORGAN, including wide mass range searches for axion-like particles.

1. Ben T. McAllister, Graeme Flower, Lucas E. Tobar, Michael E. Tobar, "Tunable Super-Mode Dielectric Resonators for Axion Haloscopes", Phys. Rev. Applied 9, 014028 (2018)

Summary

I'll talk about a number of things, focusing on ORGAN, but giving an overview of our other efforts in dark matter detection.

Primary author: Mr MCALLISTER, Ben (University of Western Australia)

Co-authors: Prof. IVANOV, Eugene (UWA); Mr FLOWER, Graeme (UWA); Dr BOURHILL, Jeremy (UWA); Dr GORYACHEV, Maxim (University of Western Australia); Prof. TOBAR, Michael (The University of Western Australia)

Presenter: Mr MCALLISTER, Ben (University of Western Australia)

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